



**United
Technologies**



Value Management

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Main Message

What We're Doing: Pratt & Whitney rigorously applies Value Management

**What we need
Program Executive
Officers to do:**

- 1. Continue demanding affordability. (Thank you!)**
- 2. Encourage use of VECP's**

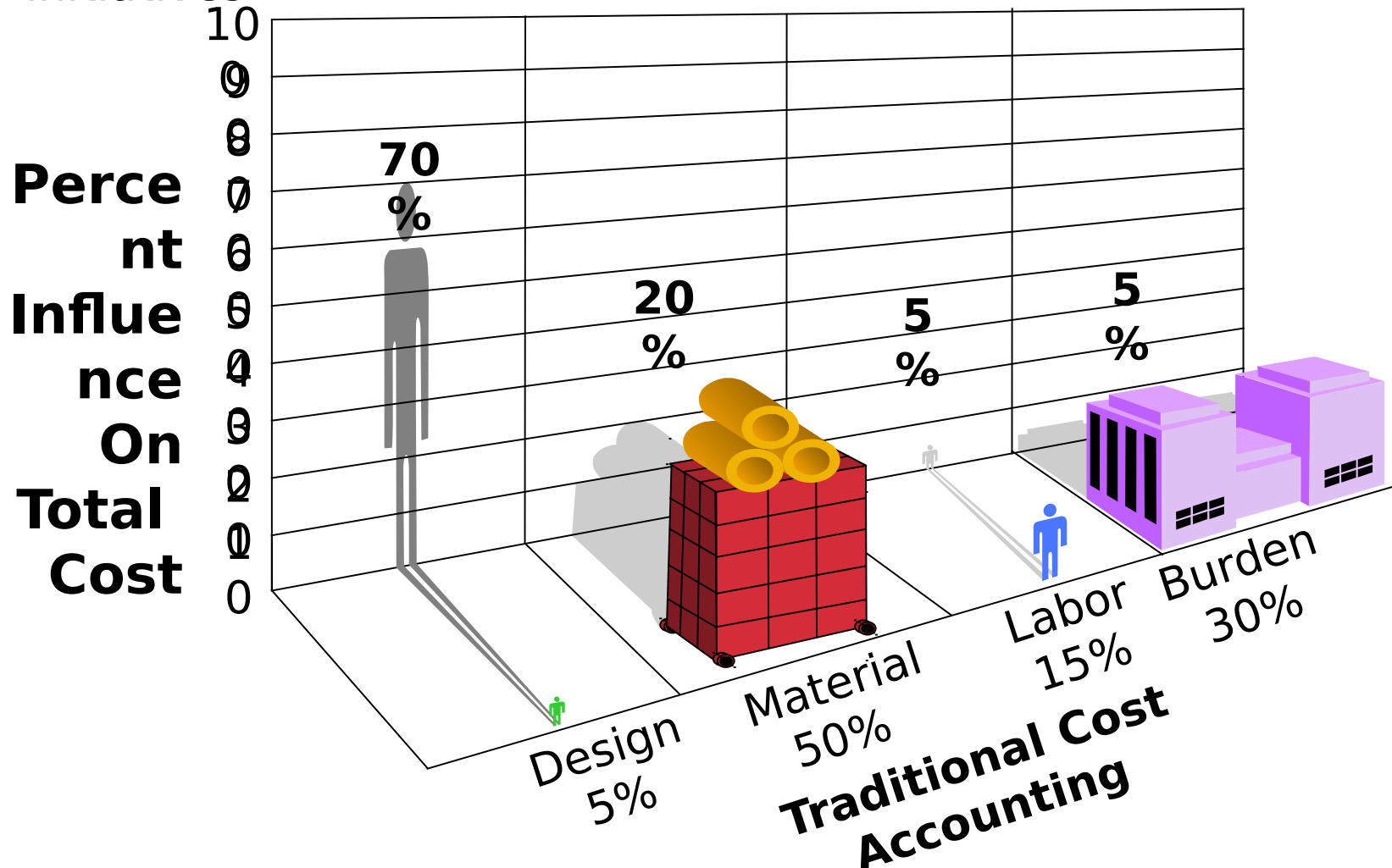
Pratt & Whitney Success Stories

- Over 14,000 ideas for F135 jet engine for Joint Strike Fighter
- Commercial engine: \$1/2 Million savings without weight increase
- Driving to do VM earlier in Design

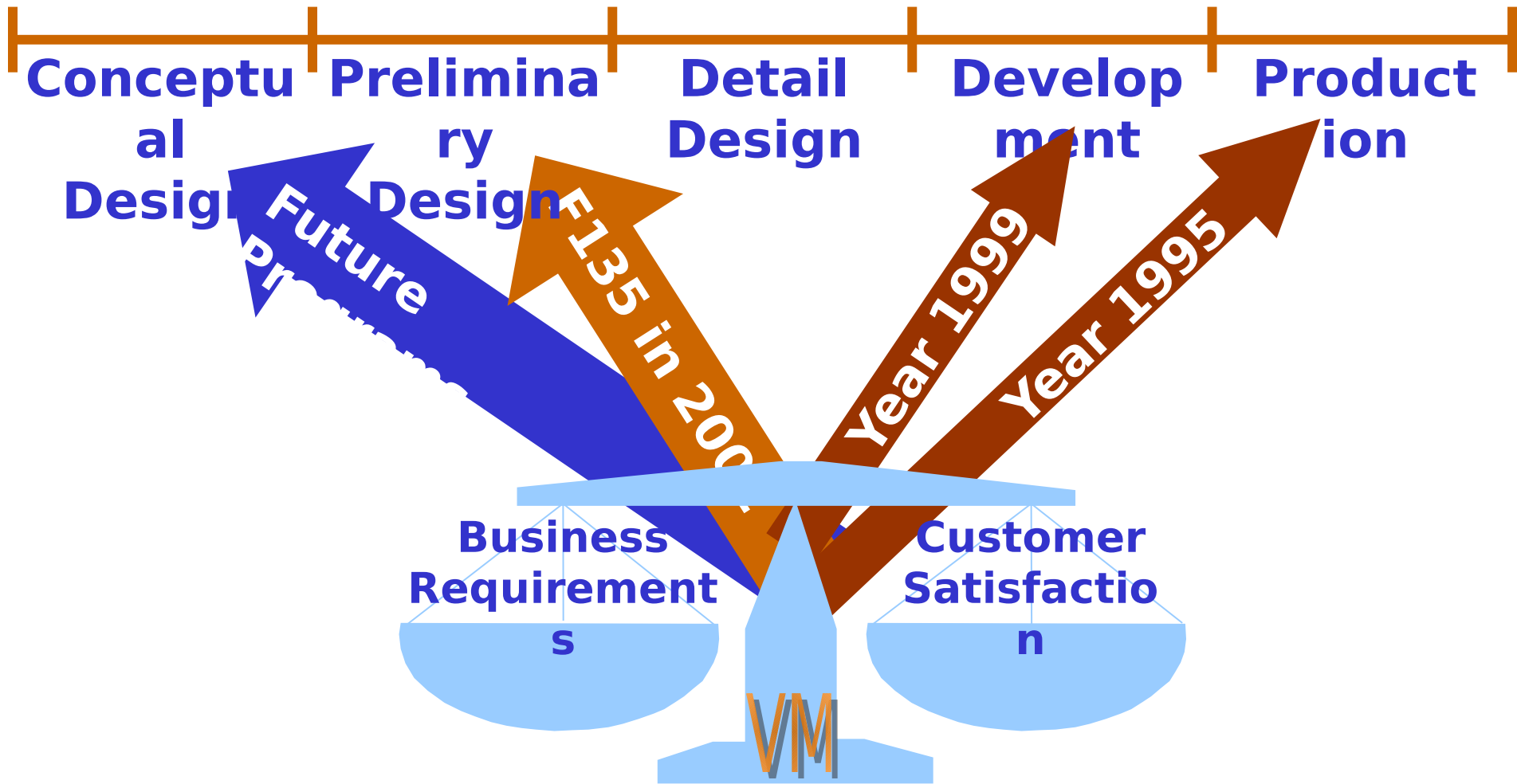


Design Influence on Value

Since up front decisions impact value the greatest, it's **imperative** to address affordability in concept stage. Create performance/cost/weight relationships & link to Affordability initiatives.



Applying Value Management



Deliver essential functions in the most profitable manner

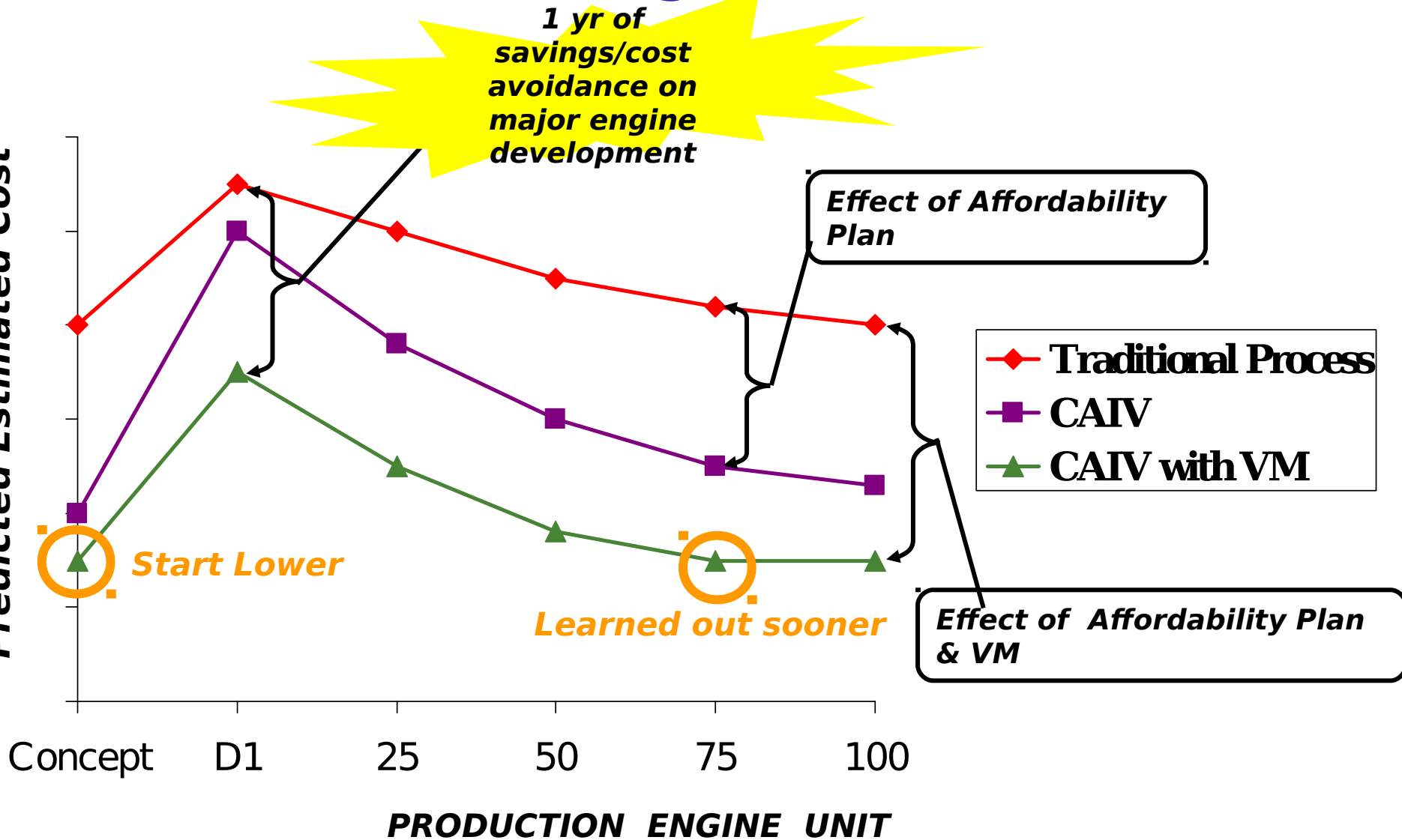
Intellectuals solve problems;
geniuses prevent them.

**--Albert
Einstein**

We think we've discovered how to
be geniuses relative to affordability.

Product Learning Curve Effect

Predicted Estimated Cost



Failures (seeds of Opportunity)

- Resistance toward VM in a few programs
 - Not invented here?
- A VM group disbanded when its executive retired
- Process shortened until it didn't deliver.
 - Grasshopper without legs is deaf?
 - Lesson learned: match length of study to magnitude of problem.

Recommended Improvements

- Pull VM into conceptual design.
 - Avoid problems instead of fixing them.
- Use ranges of acceptability (versus hard points).
 - Increase potential to balance business needs with customer expectations
- Continue VM throughout product development
- Promote use of VECF's

Back-up Slides

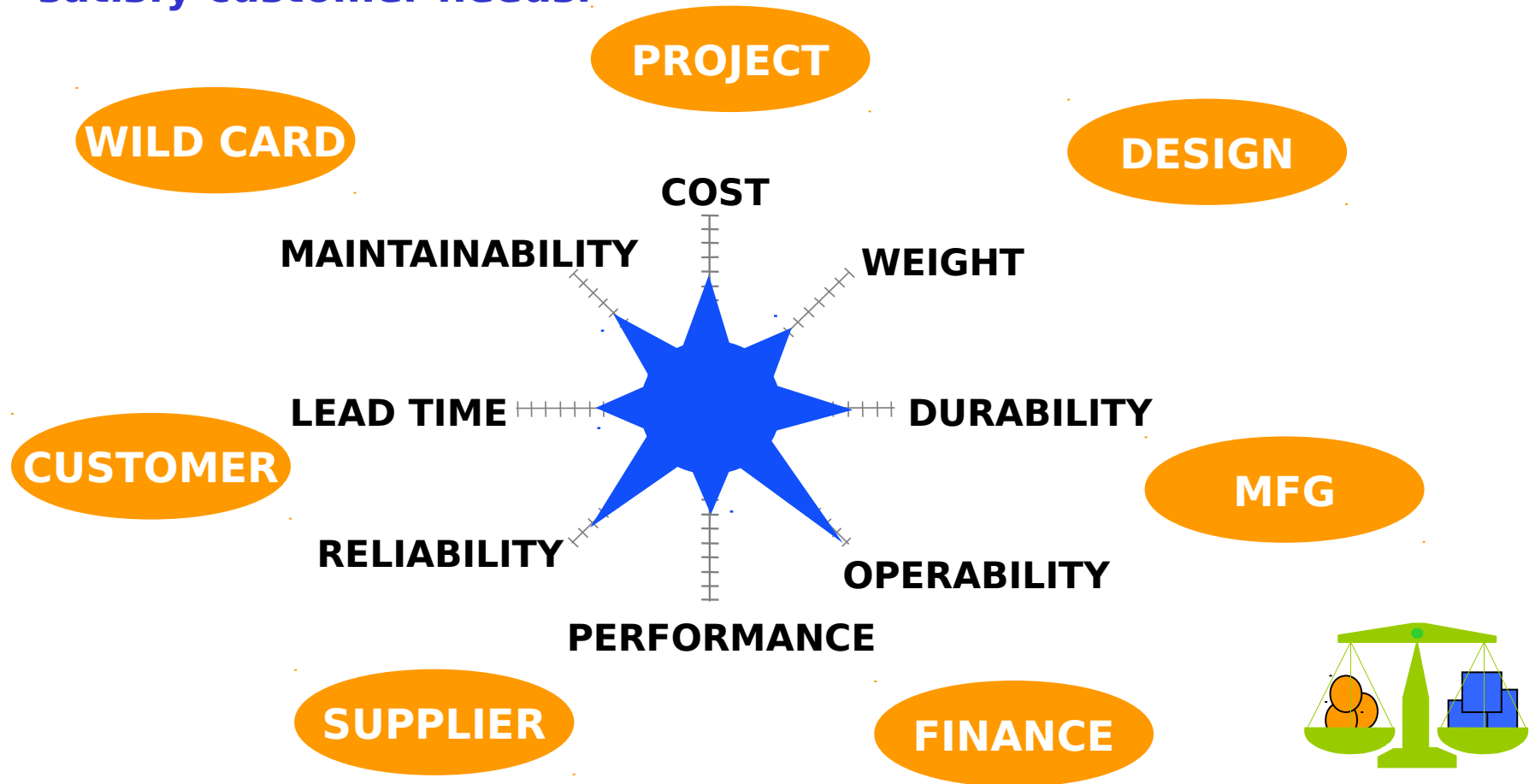
Encountered Barriers

- Organizational Culture
 - Metrics drive behavior
 - resistance at different tiers
 - (embracing change: easier said than done)
- Failure to implement opportunities
 - inadequate resources
 - risk aversion
 - schedule constraints

Balancing Design

Deliver essential functions in the most profitable manner.

Ensuring *stakeholders* & *requirements* are working together to satisfy customer needs.



Why VM Works

“The mere formulation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill.

To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.”

- Albert Einstein

Function analysis via FAST
modeling is all about
understanding problems *with* new

**vers
us**



Value Management

Process

- 2-3 days analyzing the problem
- full day brainstorming
- 2 days sifting ideas
- 1 day packaging and analyzing
- Weeks implementing ideas

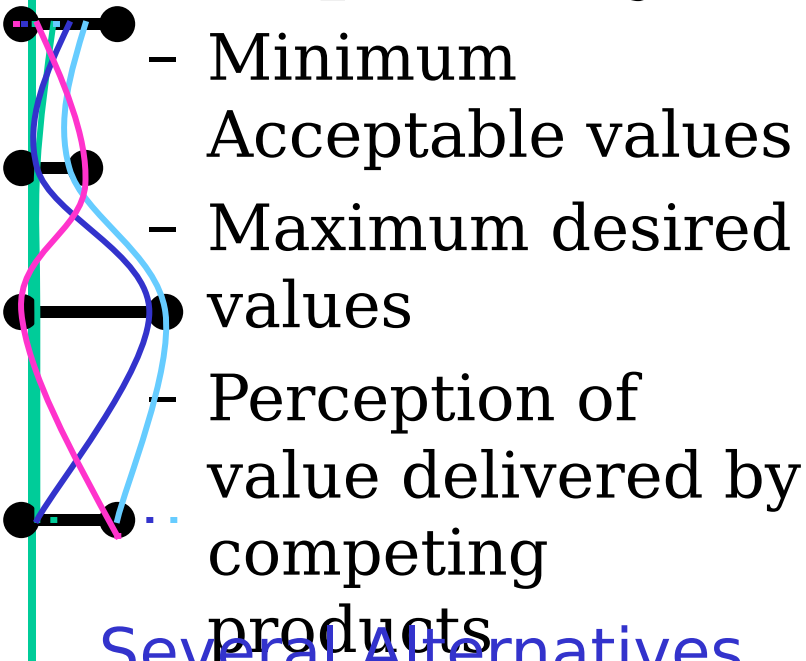
Conventional Problem

Solving

- A couple of hours deciding what to work on
- a half hour brainstorming
- Weeks to try to make the ideas work, revisiting brainstorming

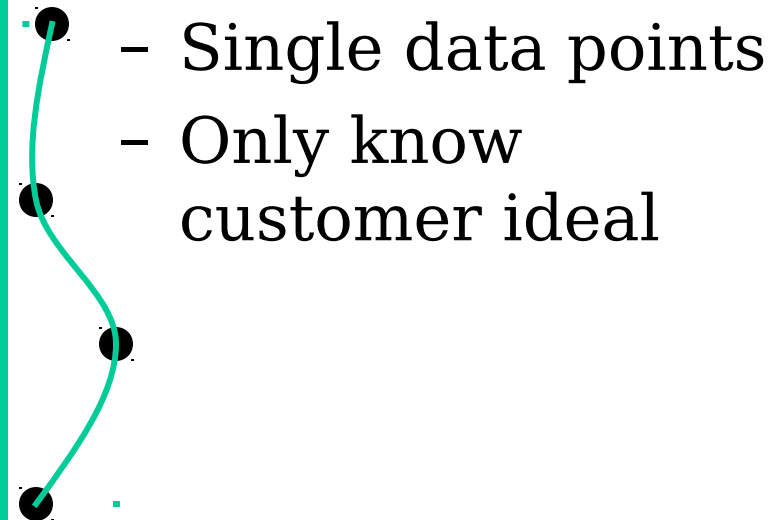
Key Function of Customer Input

- **Communicate Ranges of Acceptability**



--Vs.--

- **Communicate Requirements**



Make Balanced Trades Possible